

Specifically say where you are using Archimedean's Property (or one of its corollaries) when you use it. Below is a list of the versions of Archimedean's Property that we showed in class.

**Thm AP.** (Archimedean's Property)  $(\forall b \in \mathbb{R}) (\forall a \in \mathbb{R}^{>0}) (\exists n \in \mathbb{N}) [b < na]$

**Cor. 1.**  $(\forall x \in \mathbb{R}) (\exists n \in \mathbb{N}) [x < n]$

**Cor. 2.**  $(\forall \varepsilon > 0) (\exists n \in \mathbb{N}) \left[\frac{1}{n} < \varepsilon\right]$

**Cor. 3.**  $(\forall z \in \mathbb{R}^{>0}) (\exists n \in \mathbb{N}) [n - 1 \leq z < n]$

**Variant of book's ER 2.4.1**

§2.4  
BS4p44

Prove that

$$\sup \left\{ 1 - \frac{1}{n} : n \in \mathbb{N} \right\} = 1 .$$

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